

# Work Order ID 72860

Tuesday, August 16, 2011 4:06:08 PM



Page 1

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 8/16/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 9/6/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date: 11-08-16

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr

Revision Nbr

D2580-041

Rev.D DEO-D1

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile & type labels per PPP D205-634-041 CHG002

S. Mor/17

ML 11-9-26

110

0.00



BENDING MACHINE - SKIDTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio 16

2-Cut tubes as per Dwg. D2580

3- scribe batch# in aft end of tube

11-9-13

72860

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
	Skidtubes								
	Memo	0.00							
	1- Deburr ends and remove bending marks								
	2- Prepare tube for welding as per QSI 004								
130									
	QC5- Inspect part completeness to step on W/O	0.00							
	Memo	0.00							
	Quality Control								

DL  
4/09/14

1 0 8611/09/14

W/O:		WORK ORDER CHANGES					
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Stop



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

140

0.00



Skidtubes

Skidtubes

Memo

0.00

1-Weld step D2576 as per Dwg. D2580 and QSI004  
A/R ☐ ☐ Aluminum Rod

11/18/20

BE 11/09/19

2-Grind welds on step as per Dwg D2580

DL 11/09/20

3-Weld spacers as per dwg D2580

BE 11/09/20

3- \*\*\* N/A\*\*\*\* Insert D4202-1 spacer, swage as per QSI002 and trim/ grind  
flush per QSI002 and dwg. Hold x-bolt with DT9701 Use tube expander 1/2  
x17G to start expansion and finish with 1/2 x 18G to achieve dwg dimension.

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64",  
adjust stopper not to hit web. Deburr

DL 11/09/20

6-Drill pilot holes for aft cap using DT 8215 Open holes to 0.208". Deburr

7-Drill pilot holes for Tow ring using DT8091, open to .640" and Deburr

BB 11/09/21

W/O:		WORK ORDER CHANGES					
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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150  QC Quality Control	QC10- Inspect visual per QSI004- ground welds  Memo	0.00 0.00		Sub 22					
160  QC Quality Control	QC5- Inspect part completeness to step on W/O  Memo	0.00 0.00		Sub 22					He
170  HandFinish Hand Finishing	Pressure Wash per QSI005 4.3  Memo Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.	0.00 0.00							1 BL 11-9-22

W/O:		WORK ORDER CHANGES					
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Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180  Powdercoat Powder Coating	White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum	0.00							
<div>Memo</div> <div>START TIME: 11:10</div> <div>OVEN TEMPERATURE: 320 °F</div> <div>FINISH TIME: 11:40</div>									
190  QC	QC3- Inspect Part Finish	0.00							
<div>Memo</div>									
Quality Control									

1X Ø m-d 11/09/22

1 PR 11-9-24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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200

0.00



HandFinish

Memo

0.00

Hand Finishing

1-Install inserts & wearplates & Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates  
A/R ☐ ☐ ☐ Sikaflex-291 ☐ 118393  
Sikaflex expire date: 12-5

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive  
A/R ☐ ☐ ☐ Sikaflex-291 ☐ 118393  
Sikaflex expire date: 12-5

5-Wing Walk as per Dwg D2580 and QSI 005 4.4  
Batch: 118393

1 BX 11-9-24

W/O:		WORK ORDER CHANGES					
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Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210  QC Quality Control	QC5- Inspect part completeness to step on W/O  Memo Inspect Aft Cap, Fwd Step and Wing Walk of work to Current Step Inspect for Foreign objects per QSI 024	0.00  0.00		5/16/26					
220  Packaging Packaging	Packaging  Memo Identify and pack for shipping as per PPPD205-634-041 Location: _____ PPP Rev: _____	0.00  0.00							
230  QC Quality Control	QC21- Final Inspection - Work Order Release  Memo	0.00  0.00							

11/9/27 @

11/9/28  
MF 11-09-27

W/O:		WORK ORDER CHANGES					
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Page 1

Work Order ID: 72860

Parent Item: D205-634-041

Parent Item Name: Replacement Skidtube



Start Date: 8/16/2011

Required Date: 9/6/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30  
KJ IPP Rev P 10.02.19  
per PAR09-043 EC verified by:DD  
IPP Rev. O 06.02.28 Added paperwork EC  
IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM IPP Rev:Q  
10.12.01 as per chg003 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D4202-1	D2579	Manufactured	No			140	Each	443.0000	20	20			
---------	-------	--------------	----	--	--	-----	------	----------	----	----	--	--	--



Spacer

Location	Loc Qty	Loc Code
LG002	443	
66929	106	
67129	196	
67308	1	
67430	140	

D2580-1		Manufactured	No			110	Each	1.0000	1	1			
---------	--	--------------	----	--	--	-----	------	--------	---	---	--	--	--



205 Skidtube bent detail

Location	Loc Qty	Loc Code
LG B72966	1	
71014	1	

D2576-3		Manufactured	No			140	Each	30.0000	1	1			
---------	--	--------------	----	--	--	-----	------	---------	---	---	--	--	--



Step (maching detail)

Location	Loc Qty	Loc Code
LG	30	
66156	30	

Bed 09/19  
B 72672 20

① 11-9-13  
BE 09/19

W/O:		WORK ORDER CHANGES					
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Start Date: 8/16/2011

Required Date: 9/6/2011

Start Qty: 1.00

Required Qty: 1.00

D2855 Manufactured No 200 Each 32.0000 1 1  
Cap

Location Loc Qty Loc Code

FP007 32  
65519 2  
65569 30

AN3-5A Purchased No 200 Each 737.0000 2 2  
Bolt

Location Loc Qty Loc Code

ST350 737  
115371 46  
117423 691

AN960JD10L NAS1149D0332J Purchased No 200 Each 0.0000 2 2  
Washer

ALS7-1032-130 Purchased No 200 Each 1,155.000 50 50  
Insert

Location Loc Qty Loc Code

ST282 1155  
117717 899  
118386 256

BK 11-9-24.

BK 11-9-24.

BK 11-9-24.

BK 11-9-24.

W/O:		WORK ORDER CHANGES					
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Required Date: 9/6/2011

Start Qty: 1.00

Required Qty: 1.00

AN3C4A Purchased No 200 Each 1,361.000 50 50



BOLT



BL 11-9-24

Location	Loc Qty	Loc Code
ST350 118628	1361	
117313	2	
117688	36	
117795	1	
117872	22	
118012	260	
118112	40	
118451	1000	

50

AN960C10L NAS1149C0332 ✓ Purchased No



washer

D3566-13

Manufactured No



Gasket

118354

0.0000 50 50



50

BL 11-9-24

Location	Loc Qty	Loc Code
FP	8	
69281	8	
FP014	19	
68341	1	
72149 ✓	18	

D3566-5 Manufactured No



Gasket

200 Each 8.0000 1 1



1

BL 11-9-24

Location	Loc Qty	Loc Code
FP015 72849	8	
68961	1	
71601	7	

1

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
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Start Qty: 1.00

Required Qty: 1.00

D3566-1  
Gasket  
Manufactured No

200 Each

8.0000

2 2

Location

Loc Qty

Loc Code

FP011

72848

6

71580

6

FP015

68924

2

2

D3564-11  
Wearshoe  
Manufactured No

200 Each

18.0000

1 1

Location

Loc Qty

Loc Code

FP019

67591

4

4

FP020

72207

14

14

D3564-13  
Wearshoe  
Manufactured No

200 Each

12.0000

1 1

Location

Loc Qty

Loc Code

FP016

69280

6

6

FP017

70850

6

71594

6

BL 11-9-24.

2

BL 11-9-24.

BL 11-9-24.

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Start Date: 8/16/2011

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Start Qty: 1.00

Required Qty: 1.00

D3564-9 Manufactured No

200 , Each

20.0000

1 1



Wearshoe



BL 11-9-24.

Location

Loc Qty

Loc Code

FP019

73345

6

67590

4

69943

2

FP020

14

72208

14

D3564-5 Manufactured No

200 Each

18.0000

1 1



Wearshoe



BL 11-9-24.

Location

Loc Qty

Loc Code

FG

78830

2

34806

2

FP019

16

70864

4

72164

12

D2594-3 Manufactured No

200 Each

612.0000

16 16



O-Ring, 205 Skidtube



BL 11-9-24.

Location

Loc Qty

Loc Code

FP-A

612

65518

41

66952 !

571

16.

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Shop Packet Print

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Start Date: 8/16/2011

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Start Qty: 1.00

Required Qty: 1.00

D2594-1

Manufactured No

200

Each

306.0000

16

16



Plug, 205 Skidtube



BF 11-9-24.

Location

Loc Qty

Loc Code

FP-A

306

42807

28

67441

7

68943

70

72127 ✓

201

16 -

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Shop Packet Print

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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**DART**

DESIGN <i>[Signature]</i>	DRAWN BY <i>[Signature]</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

**RELEASED**  
07.06.28 *[Signature]***DEO ATTACHED  
UNDER REVIEW***P110590*RMV *P110590*

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

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SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. *22860*  
*P1105-16***GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:  
SEE NOTES ON  
PAGE 2 FOR D2580-041 AND  
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

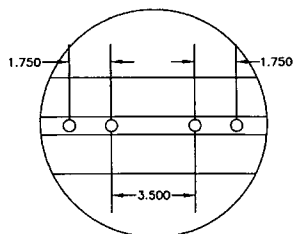
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<b>DART</b>		<b>DART AEROSPACE LTD.</b> HAMPSHIRE, ONTARIO, CANADA	
DRAWING NO. D2580		REV. SHEET 2 OF 4	
TITLE 205 SKIDTUBE ASSEMBLY		SCALE 1:2	

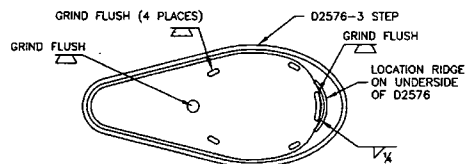
72860

**DETAIL E**  
SCALE 5:24



**RELEASED**  
07.06.30

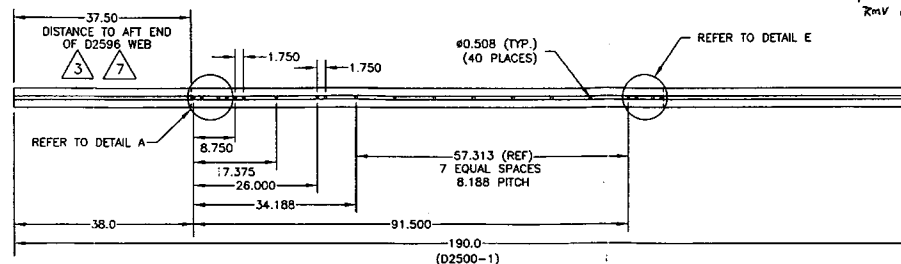
**DETAIL F**  
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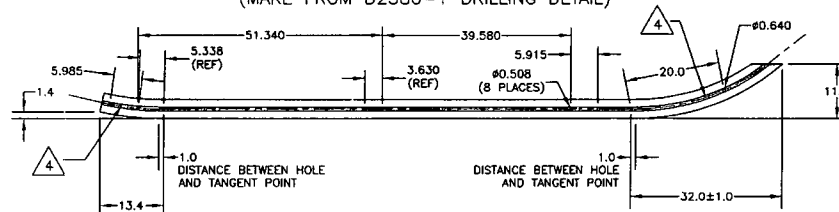
**UNDER REVIEW**

11.06.30  
RMV 07.06.30

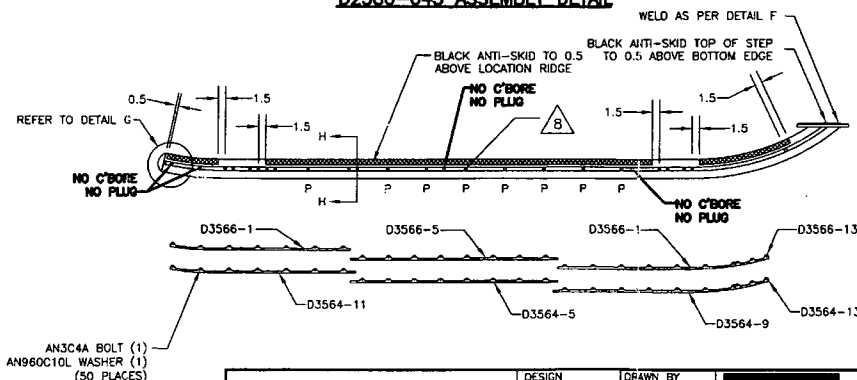
**D2580-1 DRILLING DETAIL**



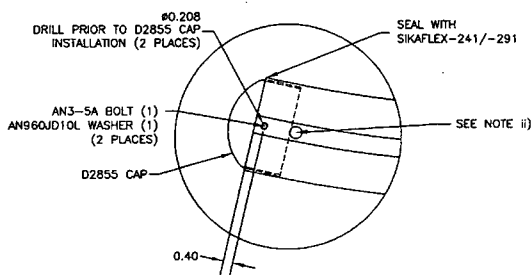
**D2580-5 BENDING AND CUTTING DETAIL**  
(MAKE FROM D2580-1 DRILLING DETAIL)



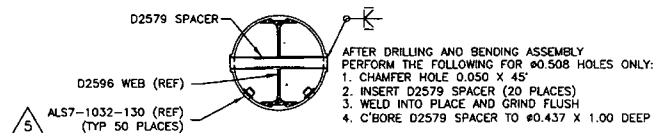
**D2580-045 ASSEMBLY DETAIL**



**DETAIL G**  
SCALE 5:24



**SECTION H-H**  
SCALE 5:24



AFTER DRILLING AND BENDING ASSEMBLY PERFORM THE FOLLOWING FOR 0.508 HOLES ONLY:  
1. CHAMFER HOLE 0.050 X 45°  
2. INSERT D2579 SPACER (20 PLACES)  
3. WELD INTO PLACE AND GRIND FLUSH  
4. C'BORE D2579 SPACER TO 0.437 X 1.00 DEEP

**D2580-045 NOTES**

- FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.3) PER DART QSI 005 4.3 BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

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CHECKED	APPROVED	DRAWING NO.	REV. D
		D2580	SHEET 3 OF 3
DATE	TITLE	SCALE	
07.02.27	205 SKIDTUBE ASSEMBLY	1:24	



NO. 262

AWS D17.1.2001  
QUALIFICATION TEST RECORD

Name: Barclay Elliott  
Job number: B71946  
Part number: D205 634 041  
Description: 205  
Welding Process: Tig[☒] Mig[ ]  
Base material: Aluminum  
Current: AC[☒] DC[ ]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[ ]  
Penetration: pass[☒] fail[ ]

UNACCEPTABLE

Cracks: pass[☒] fail[ ]  
Undercut: pass[☒] fail[ ]  
Pin holes: pass[☒] fail[ ]  
Overlap (cold lap): pass[☒] fail[ ]  
Porosity (surface): pass[☒] fail[ ]  
Coloration: pass[☒] fail[ ]

Qualifier Barclay Elliott Date of Test Coupon 11-08-11  
Welder Barclay Elliott Date of Test Coupon 11-08-11

The above named individual is qualified in accordance with AWS D17.1.2001 to weld